

>human SULF1 full length cDNA (ORF highlighted in capitals)

ccaccaccatcatctaaagaagataaacttggcgaatgacatgcaggttctcaaggcagaataattgcagaaaatcttcaaa
ggaccctatctgcagatgttctgaatacctctgagaatagagattgattatcaaccaggatacctaattcaaggactccagaaat
caggagacggagacattttgtcagttttgcaacattggaccaaatacaATGAAGTATTCTTGCTGTGCTCTGG
TTTTGGCTGTCCTGGGCACAGAATTGCTGGGAAGCCTCTGTTGACTGTGAGATCCCC
GAGGTTTCAGAGGACGGATACAGCAGGAACGAAAAAACATCCGACCCAACATTATTCTTG
TGCTTACCGATGATCAAGATGTGGAGCTGGGGTCCCTGCAAGTCATGAACAAAACGAG
AAAGATTATGGAACATGGGGGGGGCCACCTTCATCAATGCCTTTGTGACTACACCCATGT
GCTGCCCGTCACGGTCCTCCATGCTCACCGGGAAGTATGTGCACAATCACAATGTCTA
CACCAACAACGAGAACTGCTCTTCCCCCTCGTGGCAGGCCATGCATGAGCCTCGGACT
TTTGCTGTATATCTTAACAACACTGGCTACAGAACAGCCTTTTTTGGAAAATACCTCAATG
AATATAATGGCAGCTACATCCCCCCTGGGTGGCGAGAATGGCTTGGATTAATCAAGAATT
CTCGCTTCTATAATTACACTGTTTGTGCGCAATGGCATCAAAGAAAAGCATGGATTGATTA
TGCAAAGGACTACTTCACAGACTTAATCACTAACGAGAGCATTAACTTCAAAATGTCT
AAGAGAATGTATCCCCATAGGCCCGTTATGATGGTGATCAGCCACGCTGCGCCCCACG
GCCCCGAGGACTCAGCCCCACAGTTTTCTAAACTGTACCCCAATGCTTCCCAACACATA
ACTCCTAGTTATAACTATGCACCAAATATGGATAAACACTGGATTATGCAGTACACAGGAC
CAATGCTGCCCATCCACATGGAATTTACAAACATTCTACAGCGCAAAAGGCTCCAGACT
TTGATGTCAGTGGATGATTCTGTGGAGAGGCTGTATAACATGCTCGTGGAGACGGGGG
AGCTGGAGAATACTTACATCATTACACCGCCGACCATGGTTACCATATTGGGCAGTTTG
GACTGGTCAAGGGGAAATCCATGCCATATGACTTTGATATTCGTGTGCCTTTTTTTTATTC
GTGGTCCAAGTGTAGAACCAGGATCAATAGTCCCACAGATCGTTCTCAACATTGACTTG
GCCCCACGATCCTGGATATTGCTGGGCTCGACACACCTCCTGATGTGGACGGCAAGT
CTGTCCTCAAACCTTCTGGACCCAGAAAAGCCAGGTAACAGGTTTCGAACAAACAAGAA
GGCCAAAATTTGGCGTGATACATTCTAGTGGAAGAGAGGCAAATTTCTACGTAAGAAGG
AAGAATCCAGCAAGAATATCCAACAGTCAAATCACTTGCCCAAATATGAACGGGTCAA
GAACTATGCCAGCAGGCCAGGTACCAGACAGCCTGTGAACAACCGGGGCAGAAGTGG
CAATGCATTGAGGATACATCTGGCAAGCTTCGAATTCACAAGTGTAAAGGACCCAGTGA
CCTGCTCACAGTCCGGCAGAGCACGCGGAACCTCTACGCTCGCGGCTTCCATGACAA
AGACAAAGAGTGCAGTTGTAGGGAGTCTGGTTACCGTGCCAGCAGAAGCCAAAGAAAG
AGTCAACGGCAATTCTTGAGAAACCAGGGGACTCCAAAGTACAAGCCCAGATTTGTCC
ATACTCGGCAGACACGTTCTTGTCCGTGCAATTTGAAGGTGAAATATATGACATAAATC
TGGAAGAAGAAGAAGATTGCAAGTGTTGCAACCAAGAAACATTGCTAAGCGTCATGAT
GAAGGCCACAAGGGGCCAAGAGATCTCCAGGCTTCCAGTGGTGGCAACAGGGGCGAG
GATGCTGGCAGATAGCAGCAACGCCGTGGGCCCCACCTACCACTGTCCGAGTGACACA
CAAGTGTTTTATTCTTCCCAATGACTCTATCCATTGTGAGAGAGAACTGTACCAATCGGC
CAGAGCGTGGAAGGACCATAAGGCATACATTGACAAAGAGATTGAAGCTCTGCAAGATA
AAATTAAGAATTTAAGAGAAGTGAGAGGACATCTGAAGAGAAGGAAGCCTGAGGAATGT
AGCTGCAGTAAACAAAGCTATTACAATAAAGAGAAAGGTGTAAAAAAGCAAGAGAAATTA
AAGAGCCATCTTCACCCATTCAAGGAGGCTGCTCAGGAAGTAGATAGCAAACCTGCAACT
TTTCAAGGAGAACAACCGTAGGAGGAAGAAGGAGAGGAAGGAGAAGAGACGGCAGAG
GAAGGGGGAAGAGTGCAGCCTGCCTGGCCTCACTTGCTTCACGCATGACAACAACCA
CTGGCAGACAGCCCCGTTCTGGAACCTGGGATCTTTCTGTGCTTGCACGAGTTCTAAC
AATAACACCTACTGGTGTTTGGAGTATTTTGATATGAATACAGATCCTTATCAGCTCACAAATAC
AGTGCACACGGTAGAACGAGGCATTTTGAATCAGCTACACGTACAACCTAATGGAGCTCA
GAAGCTGTCAAGGATATAAGCAGTGCAACCCAAAGACCTAAGAATCTTGATGTTGGAAAT
AAAGATGGAGGAAGCTATGACCTACACAGAGGACAGTTATGGGATGGATGGGAAGGTT

FIG. 1A i

AAtcagccccgtctcactgcagacatcaactggcaaggcctagaggagctacacagtgtgaatgaaaacat
ctatgagtacagacaaaactacagacttagtctggtggactggactaattactgaaggatttagatagagtatt
gcactgctgaagagtcactatgagcaaaaataaaacaaataagactcaaactgctcaaagtgacgggttctg
gtgtctctgctgagcacgctgtgtcaatggagatggcctctgctgactcagatgaagacccaaggcataaggt
tgggaaaacaccctcatttgacctggcagctgacctcaaaccctgcatttgaaccgaccaacattaagtccag
agagtaaaactgaatggaataacgacattccagaagttaattcatttgaactctgaacactggagaaaaaccga
aaaatggacggggcatgaagagactaatcatctggaaaccgatttcagtggcgatggcatgacagagctag
agctcggggcccgagcccgagctgcagcccattcgagggcaccgaaagaactccccagtatggtggtcct
ggaaaggacattttgaagatcaactatatcttctgtgcatccgatggaatttcagttcatcagatgttcaccatg
gccaccgcagaacaccgaagtaattccagcatagcgggggaagatgttgaccaaggtggagaagaatcac
gaaaaggagaagtcacagcacctagaaggcagcgctctctcactctcctctgattagatgaaactgttac
cttaccctaaacacagtatcttctttaaactttttattgttaaactaataaaggtaatcacagccaccaacattcaa
gctaccctgggtaccttgtgcagtagaagctagttagcatgtgagcaagcgggtgtgcacacggagactcatc
gttataattactatctgccaagagtagaaagaaggctggggatatttgggtggctgtgtttgattttgtctgtt
gtttgtttgtactaaaacagtatcttcttgaatatcgtagggacataagtatatacatgttatccaatcaagatgg
ctagaatgggtgccttctgagtgtctaaaacttgacacccctggtaaactcttcaacacactccactgcctgcgt
atgaagtttgattcattttaaccactggaattttcaatgccgtcattttagatgatttgcactttgagattaa
aatgccatgtctatttgattagcttattttttttttacaggcctatcagctcactgttggctgtcattgtgacaaagt
caataaaaccccaaggacgacacacagtatggatcacatattgttgacattaagctttgccagaaaatgtt
gcatgtgtttacctcgacttgctaaaatcgattagcagaaaggcatggctaataatgttgggtgtaaaataaat
aaataagtaaaacaaaatgaagattgcctgctctctgctgctagcctcaaagcgttcatacatataccttt
aagattgctatatttgggtattttctgacaggagaaaaagatctaaagatctttattttcatctttttgtttctgg
catgactaagaagcttaaatgttgataaaaatagactagtttgaatttacaccaagaactctcaataaaaagaa
aatcatgaatgtccacaattcaacataaccacaagagaagtaatttctaactgtgttctatgattttgttaa
gaccttcaccaagttctgatatctttaaagacatagttcaaaattgctttgaaaatctgtattcttgaaaatctctt
gttgtgtattaggttttaataaccagctaaaggattacctcactgagtcacagtaacctcctattcagctcccaa
gatgatgtgttttgcttaccctaagagaggttttctcttatttttagataattcaagtgcctagataaattatgtttctt
aagtgtttatggtaaaactctttaaagaaaatttaatatgttatagctgaatcttttgtaactttaaactcttatcatag
actctgtacatatgttcaaattagctgctgcctgatgtgtgtatcatcggtgggatgacagaacaaacataattat
gatcatgaataatgtgctttgtaaaaagattcaagttattaggaagcatactctgtttttaaactgtataatattcc
atgatactttatagaacaattctggcttcaggaaagtctagaagcaatatttcttcaataaaaagggttttaaactt
taaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa

FIG. 1A ii

10025955-122101

>human SULF1 amino acid sequence--translation of ORF
MKYSCCALVLAVLGTELLGSLCSTVRSPRFRGRIQQERKNIRPNILVLTDDQDVELG
SLQVMNKTRKIMEHGGATFINAFVTTTPMCCPSRSSMLTGKYVHNHNVYTNNECS
SPSWQAMHEPRTFAVYLNNTGYRTAFFGKYLNEYNGSYIPPGWREWLGLIKNSRF
YNYTVCRNGIKEKHGFDYAKDYFTDLITNESINYFKMSKRMYPHRPVMMVISHAAP
HGPEDSAPQFSKLYPNASQHITPSYNYAPNMDKHWIMQYTGPMPLIHMEFTNILQR
KRLQTLMSVDDSVRLYNMLVETGELENTYIIYTADHGYPHIGQFGLVKGKSMPYDF
DIRVPFFIRGPSVEPGSIVPQIVLNIDLAPTILDIAGLDTPPDVDGKSVLKLLDPEKPG
NRFRTNKKAKIWRDFTLVERGKFLRKKEESSKNIQQSNHLPKYERVKELCQQARY
QTACEQPGQKWQCIEDTSGKLRIHKCKGPSDLLTVRQSTRNLYARGFHDKDKECS
CRESGYRASRSQRKSQRQFLRNQGTTPKYKPRFVHTRQTRSLVEFEFEIYDINLE
EEEEELQVLQPRNIAKRHDEGHKGPRLQASSGGNRGRMLADSSNAVGPPTTVRV
THKCFILPNDSIHCERELYQSARAWKDHKAYIDKEIEALQDKIKNLREVRGHLKRRK
PEECSCSKQSYYNKEKGVKKQEKLSHLHPFKEAAQEVDSKLQLFKENNRRRKKE
RKEKRRQRKGEECSLPGLTCFTHDNNHWQTAPFWNLGSFCACTSSNNNTYWCL
RTVNETHNFLFCEFATGFLEYFDMNTDPYQLTNTVHTVERGILNQLHVQLMELRSC
QGYKQCNPRPKNLDVGNKDGGSYDLHRGQLWDGWEG

FIG. 1B

FIG. 1B

>human SULF2 full length cDNA (ORF highlighted in capitals)

TGAgactcccgcatcccaaaagaagcaccagatcagcaaaaaagaagATGGGCCCCCGAGCCTCGT
GCTGTGCTTGCTGTCCGCAACTGTGTTCTCCCTGCTGGGTGGAAGCTCGGCCTTCCT
GTCGCACCACCGCCTGAAAGGCAGGTTTCAGAGGGACCGCAGGAACATCCGCCCCA
ACATCATCCTGGTGCTGACGGACGACCAGGATGTGGAGCTGGGTTCCATGCAGGTG
ATGAACAAGACCCGCGCATCATGGAGCAGGGCGGGGCGCACTTCATCAACGCCTT
CGTGACCACACCCATGTGCTGCCCCTCACGCTCCTCCATCCTCACTGGCAAGTACGT
CCACAACCACAACACCTACACCAACAATGAGAACTGCTCCTCGCCCTCCTGGCAGGC
ACAGCACGAGAGCCGCACCTTTGCCGTGTACCTCAATAGCACTGGCTACCGGACAGC
TTTCTTCGGGAAGTATCTTAATGAATACAACGGCTCCTACGTGCCACCCGGCTGGAAG
GAGTGGGTGCGGACTCCTTAAAAACTCCCGCTTTTATAACTACACGCTGTGTGCGGAACG
GGGTGAAAGAAAAGCACGGCTCCGACTACTCCAAGGATTACCTCACAGACCTCATCA
CCAATGACAGCGTGAGCTTCTTCCGCACGTCCAAGAAGATGTACCCGCACAGGCCAG
TCCTCATGGTCATCAGCCATGCAGCCCCCACGGCCCTGAGGATTCAGCCCCACAAT
ATTCACGCCTCTTCCCAACGCATCTCAGCACATCACGCCGAGCTACAACCTACGCGC
CCAACCCGGACAAACACTGGATCATGCGCTACACGGGGGCCCATGAAGCCCATCCACA
TGGAATTCACCAACATGCTCCAGCGGAAGCGCTTGACAGACCCTCATGTCCGTGGACG
ACTCCATGGAGACGATTTACAACATGCTGGTTGAGACGGGCGAGCTGGACAACACGT
ACATCGTATACACCGCCGACCACGGTTACCATCATCGGCCAGTTTGGCCTGGTGAAAG
GGAAATCCATGCCATATGAGTTTGACATCAGGGTCCCGTTCTACGTGAGGGGGCCCCA
ACGTGGAAGCCGGCTGTCTGAATCCCCACATCGTCCTCAACATTGACCTGGCCCCCA
CCATCCTGGACATTGCAGGCCTGGACATACCTGCGGATATGGACGGGAAATCCATCCT
CAAGCTGCTGGACACGGAGCGGCCGGTGAATCGGTTTCACTTGAAAAAGAAGATGA
GGGTCTGGCGGGACTCCTTCTTGGTGGAGAGAGGCAAGCTGCTACACAAGAGAGAC
AATGACAAGGTGGACGCCCAGGAGGAGAACTTTCTGCCCAAGTACCAGCGTGTGAA
GGACCTGTGTGAGCGTGCTGAGTACCAGACGGCGTGTGAGCAGCTGGGACAGAAGT
GGCAGTGTGTGGAGGACGCCACGGGGAAGCTGAAGCTGCATAAGTGCAAGGGGCC
CATGCGGCTGGGCGGCAGCAGAGCCCTCTCCAACCTCGTGCCCAAGTACTACGGGC
AGGGCAGCGAGGCCTGCACCTGTGACAGCGGGGACTACAAGCTCAGCCTGGCCGG
ACGCCGGAAAAAACTCTTCAAGAAGAAGTACAAGGCCAGCTATGTCCGCAGTCGGTC
CATCCGCTCAGTGGCCATCGAGGTGGACGGCAGGGTGTACCACGTAGGCCTGGGTG
ATGCCGCCAGCCCCGAAACCTACCAAGCGGCACTGGCCAGGGGGCCCCCTGAGGA
CCAAGATGACAAGGATGGTGGGGACTTCAGTGGCACTGGAGGCCTTCCCAGTACT
CAGCCGCCAACCCCATTAAGTGACACATCGGTGCTACATCCTAGAGAACGACACAG
TCCAGTGTGACCTGGACCTGTACAAGTCCCTGCAGGCCTGGAAAGACCACAAGCTG
CACATCGACCACGAGATTGAAACCCTGCAGAACAAAATTAAGAACCTGAGGGAAGTC
CGAGGTCACCTGAAGAAAAAGCGGCCAGAAGAATGTGACTGTACACAAAATCAGCTAC
CACACCCAGCACAAAGGCCGCCTCAAGCACAGAGGCTCCAGTCTGCATCCTTTCAG
GAAGGGCCTGCAAGAGAAGGACAAGGTGTGGCTGTTGCGGGAGCAGAAGCGCAAG
AAGAACTCCGCAAGCTGCTCAAGCGCCTGCAGAACACGACACGTGCAGCATGCC
AGGCCTCACGTGCTTACCCACGACAACCAGCACTGGCAGACGGCGCCTTTCTGGA
CACTGGGGCCTTTCTGTGCCTGCACCAGCGCCAACAATAACACGTACTGGTGCATGA
GGACCATCAATGAGACTCACAATTTCTTCTGTGAATTTGCAACTGGCTTCCTAGA
GTACTTTGATCTCAACACAGACCCCTACCAGCTGATGAATGCAGTGAACACACTGGAC
AGGGATGTCTCAACCAGCTACACGTACAGCTCATGGAGCTGAGGAGCTGCAAGGGT
TACAAGCAGTGTAAACCCCGGACTCGAAACATGGACCTGGGACTTAAAGATGGAGGA
AGCTATGAGCAATACAGGCAGTTTCAGCGTCGAAAGTGGCCAGAAATGAAGAGACCT
TCTTCCAAATCACTGGGACAACTGTGGGAAGGCTGGGAAGGTTAAgaacaacagaggtgg

FIG. 2A i

10025966 " 122101

acctccaaaaacatagaggcatcacctgactgcacaggcaatgaaaaacatgtgggtgattccagcagacctgtgctat
tggccaggaggcctgagaaagcaagcacgcactctcagtcaacatgacagattctggaggataaccagcaggagcaga
gataacttcaggaagtcattttgcccctgctttgcttgattatacctcaccagctgcacaaaatgcatttttcgtatcaaaa
agtcaccactaaccctccccagaagctcacaaggaaaaacggagagagcgagcgagagagatttccttgaaatttctc
ccaagggcgaaagtcattggaatttttaaatcataggggaaaagcagtcctgttctaaatcctcttattctttggttgacaaa
gaaggaactaagaagcaggacagaggcaacgtggagaggctgaaaacagtgcagagacgttgacaatgagtcagta
gcacaaaagagatgacatttacctagcactataaacctggtgcctctgaagaaactgccttcattgtatatatgtgactattta
catgtaatcaacatgggaacttttaggggaacctataagaaatcccaatttcaggagtgtggtgtcaataaacgctctgtg
gccagtgtaaaagaaaaaaaaaaaaaaaaa

FIG. 2A ii

FIG. 2A ii

>human SULF2 amino acid sequence--translation of ORF
MGPPSLVLCLLSATVFSLLGGSSAFLSHHRLKGRFQRDRRNIRPNIILVLTDDQDVELGSM
QVMNKTRRIMEQGGGAHFNAFVTTMCCPSRSSILTGYVHNHNTYTNNENCSSPSWQ
AQHESRTFAVYLNSTGYRTAFFGKYLNEYNGSYVPPGWKEWVGLLKNSRFYNYTLCRN
GVKEKHGSDYSKDYLTDLITNDSVSFFRTSKKMYPHRPVLMVISHAAPHGPEDSAPQYS
RLFPNASQHITPSYNYAPNPDKHWIMRYTGPMKPIHMEFTNMLQQRKRLQTLMSVDDSM
TIYNMLVETGELDNTYIVYTADHGYHIGQFGLVKGKSMPIYEFDIRVPFYVRGPNVEAGCL
NPHIVLNIDLAPTILDIAGLDIPADMKGKSLKLLDTERPVNRFHLKKKMRVWRDSFLVERG
KLLHKRDNDKVDAQEENFLPKYQVRKDLQRAEYQTACEQLGQKWQCVEDATGKLKLH
KCKGPMRLGGSRALSNLVPKYYGQGSEACTCDSGDYKLSLAGRRKKLFKKKYKASYVR
SRSIRSAIEVDGRVYHVGLGDAAQPRNLTKRHWPGAPEDQDDKDGGDFSGTGGLPDY
SAANPIKVTHRCYILENDTVQCDLDLYKSLQAWKDHKLHIDHEIETLQNKIKNLREVRGHL
KKKRPEECDCHKISYHTQHKGRCLKHRGSSLHPFRKGLQEKDKVWLLREQKRKKKLRLKL
KRLQNNDTCSMPLTCTFHDNQHWQTAPFWTLGPFCACTSANNTYWCMRTINETHN
FLFCEFATGFLEYFDLNTDPYQLMNAVNTLDRDVLNQLHVQLMELRSCKGYKQCNPRTR
NMDLGLKDGGSYEQYRQFQRRKWPEMKRPSSKSLGQLWEGWEG

FIG. 2B

10025966-129101

>mouse SULF1 full length cDNA (ORF fragments highlighted in capitals)

cttcaccttgagaaggtgaattccctaagacatgcagtttctcaagccagaatccttgagggaaccttcaaaggactcctt
ctgcagatgttttgaaacctctgagctagaaatcgattatccaccaggataccttattcaagctcccagaactcaccggacc
aaggagcttgaagactttgcaactttggaccaagcacaATGAAGTATTCCCTCTGGGCTCTGCTGCTT
CCCCTGCTGGGCACACAGCTGCTGGGAACCCCTGTGTTCCACCGTTCCGGTCCCAGAG
GTTCCGAGGAAGGATACAGCAGGAACGAAAAACATCCGACCCAACATTATTCTTGTG
CTTACCGATGATCAAGATGTGGAGCTGGGGTCCCTGCAAGTCATGAACAAAACGAGA
AAGATTATGGAACATGGGGGGGGCCACCTTCATCAATGCCCTTGTGACTACACCCATGT
GCTGCCCCGTACGGTCTCCATGCTCACCGGGAAGTATGTGCACAATCACAATGTCT
ACACCAACAACGAGAACTGCTCTTCCCCCTCGTGGCAGGCCATGCATGAGCCTCGG
ACTTTTGCTGTATATCTTAACAACACTGGCTACAGAACAGCCTTTTTTGAAAAATACCT
CAATGAATATAATGGCAGCTACATCCCCCTGGGTGGCGAGAATGGCTTGGATTAATC
AAGAATTCTCGCTTCTATAATTACACTGTTTGTGCAATGGCATCAAAGAAAAGCATGG
ATTTGATTATGCAAAGGACTACTTCACAGACTTAATCACTAACGAGAGCATTAACTT
CAAAATGTCTAAGAGAATGTATCCCCATAGGCCCGTTATGATGGTGATCAGCCACGCT
GCGCCCCACGGCCCCGAGGACTCAGCCCCACAGTTTTCTAAACTGTACCCCAATGCT
TCCCAACACATAACTCCTAGTTATAACTATGCACCAAATATGGATAAACACTGGATTATG
CAGTACACAGGACCAATGCTGCCCATCCACATGGAATTTACAAACATTCTACAGCGCA
AAAGGCTCCAGACTTTGATGTCAGTGGATGATTCTGTGGAGAGGCTGTATAACATGCT
CGTGGAGACGGGGGAGCTGGAGAATACTTACATCATTTACACCGCCGACCATGGTTA
CCATATTGGGCAGTTTGGACTGGTCAAGGGGAAATCCATGCCATATGACTTTGATATTC
GTGTGCCTTTTTTTATTTCGTGGTCCAAGTGTAGAACCAGGATCAATAGTCCCACAGATC
GTTCTCAACATTGACTTGGCCCCCACGATCCTGGATATTGCTGGGCTCGACACACCTC
CTGATGTGGACGGCAAGTCTGTCTCAAACCTTCTGGACCCAGAAAAGCCAGGTAACA
GGTTTCGAACAAACAAGAAGGCCAAAATTTGGCGTGATACATTCCTAGTGGAAAGAGG
CAAATTTCTACGTAAGAAGGAAGAATCCAGCAAGAATATCCAACAGTCAAATCACTTGC
CCAAATATGAACGGGTCAAAGAAGTATGCCAGCAGGCCAGGTACCAGACAGCCTGTG
AACAACCGGGGCAGAAAGTGGCAATGCATTGAGGATACATCTGGCAAGCTTCGAATTC
ACAAGTGTAAGGAGCCAGTGACCTGCTCACAGTCCGGCAGAGCACGCGGAACCTC
TACGCTCGCGGCTTCCATGACAAAGACAAAGAGTGCAGTTGTAGGGAGTCTGGTTAC
CGTGCCAGCAGAAGCCAAAGAAAGAGTCAACGGCAATTCTTGAGAAACCAGGGGAC
TCCAAAGTACAAGCCCAGATTTGTCCATACTCGGCAGACACGTTTCTTGTCCGTGCAA
TTTGAAGGTGAAATATATGACATAAATCTGGAAGAAGAAGAAGAAATTGCAAGTGTTGCA
ACCAAGAAACATTGCTAAGCGTCATGATGAAGGCCACAAGGGGGCCAAGAGATCTCCA
GGCTTCCAGTGGTGGCAACAGGGGGCAGGATGCTGGCAGATAGCAGCAACGCCGTGG
GCCCCACCTACCACTGTCCGAGTGACACACAAGTGTTTTATTCTTCCCAATGACTCTATC
CATTGTGAGAGAGAACTGTACCAATCGGCCAGAGCGTGGAAGGACCATAAGGCCTAC
ATTGATAAAGAGATTGAAGTTCTACAAGATAAAATTAAGAATTTAAGGGAAGTGAGGGG
ACACCTAAAGAAAAGGAAACCTGAGGAGTGTAGCTGTGGTGACCAGAGCTATTACAA
CAAAGAGAAAGGTGTCAAACGACAGGAGAAGCTAAAGAGTCACCTTCACCCCTTCAA
GGAGGCTGCTGCCCAGGAGGTGGATAGCAAACCTTCAGCTCTTCAAGGAGCATCGGA
GGAGGAAGAAGGAGAGGAAGGAGAAGAAACGGCAGAGGAAGGGGAGAGGAGTGTAG
CCTGCCTGGCCTTACCTGCTTCACCCATGACAACAACCACTGGCAGACTGCCCCATT
CTGGAACCTTGGGATCTTTCTGTGCCTGCACAAGTTCTAACAACAATACCTACTGGGTG
TTGCGTACAGTCAACGAGACGCACAATTTCTGTTTTGTGAGTTTGCTACTGGCTTTC
TGGAATATTTGACATGAATACGGATCCTTATCAGCTCACAAATACAGTACACACAGTA

FIG. 3Ai

GAACGAGGCATTTTGAATCAGCTACACGTACAACCTAATGGAGCTCAGAAGCTGTCA
AGGATATAAGCAGTGCAACCCAAGACCTAAGAATCTTGATGTTGGAAATAAAGATG
GAGGAAACTATGACCCGCACAGAGGACAGTTATGGGATGGATGGGAAGGTTAGTC
TTTCCAATGTTACTTCAGACACCAGCTGGCAAGGCCTGGAGGAGTTATCCGGTGC
AAGCGACATCGATGAGTACAGGTCTAACCCTAGACTAAGTCTGGAGGACTGGACT
AACTACCTGAGGGCTGTCTACAGAGCCTTTGCACTGCTGAACAGTCACCCTGATC
CAAACAAAGCAAATGGGACTCCAACCACACAAGGTGGTGACTTCCTGGT.CACCTC
TGCTGAGCGCTTGGTGCCAGCAGAGATGGCTTCTGCAGAATCAGGTGAAGACCC
AAGTCATGTGGTTGGGGAAACACCTCCTTTGACCTTGCCAGTCAACCTCCAAACC
CTGCATCTGAACAGACCAACGTTAAGTCCAGAGAGAAAACCTTGAATGGGATAATGA
CATTCCAGAAGTGAATCATTTGAATTCTGAACACTGGAGAAAAACTGAGAAGCAGA
TAGGATGGGAGGAGCTGCATCATCCTGAAGGTGACGTCGTCAGTGGCAATGGTAT
GACAGAGCTGCTGCCCCAGTCTCATCTTGGGCATCAGCTCACCAGTCAGCACCA
ACAAAAATGTTCCAGGATGTGGAGACAGAGAAGGATGCTTTTGAAGATCAATTG
CGTCCTCTTGTCCTACTCTGACAGAACTCCGGTTCATC

FIG. 3A ii

10025966-123101

>mouse SULF1 amino acid sequence--translation of ORF
MKYSLWALLLP LLGTQLLGTL CSTVRSQRFRGRIQQERKNIRPNILVLTDDQDVELGS
LQVMNKTRKIMEHGGATFINAFVTT PMCCPSRSSMLTGKYVHNHNVTNNENCSSP
SWQAMHEPRTFAVYLNNTGYRTAFFGKYLNEYNGSYIPPGWREWLG LIKNSRFYNY
TVCRNGIKEKHGFDYAKDYFTDLITNESINYFKMSKRMYPHRPVMMVISHAAPHGPE
DSAPQFSKLYPNASQHITPSYNYAPNMDKHWIMQYTGPMLPIHMEFTNILQRKRLQT
LMSVDDSVRLYNMLVETGELENTYIIYTADHG YHIGQFGLVKGKSMPYDFDIRVPFFI
RGPSVEPGSIVPQIVLNIDLAPTILDIAGLDTPPDVDGKSVLKLDDPEKPGNRFRTNKK
AKIWRDTFLVERGKFLRKKEESSKNIQQSNHLPKYERVKELCQQARYQTACEQPGQ
KWQCIEDTSGKLRIHKCKGPSDLLTVRQSTRNLYARGFHDKDKECSCRESGYRASR
SQRKSQRQFLRNQGT PKYKPRFVHTRQTRSLSEFEFEIYDINLEEEEEELQVLQPRN
IAKRHDEGHKGPRDLQASSGGNRGRMLADSSNAVGPPTTVRVTHKCFILPNDSIHCE
RELYQSARAWKDHKAYIDKEIEVLQDKIKNLREVRGHLKKRKPEECSCGDQSYYNKE
KGVKRQEKLKSHLHPFKEAAAEVDSKLQLFKEHRRRKKERKEKKRQRKGEECSLP
GLTCFTHDNNHWQTAPFWNLGSFCACTSSNNNTYWVLRTVNETHNFLFCFATGFL
EYFDMNTDPYQLTNTVHTVERGILNQLHVQLMELRSCQGYKQCNPRPKNLDVGNKD
GGNYDPHRGQLWDGWEG

FIG. 3B

FIG. 3B

>mouse SULF-2 cDNA (ORF in capital letters)

ggacgcgtgggcgagcgcgtggggtctgggcaacgcttctgcttctgagctcaacttaatttctcagagagcttcgg
agacgcgtgggaaggtcccaggcgctgggcagttctcccgcgatctagcttggggatcggtcccgagccggcgcttc
caatgatcctgaggggaagaggggaaggaatcccacctcagacaccacctcggtcctgcatccaggaagaagca
aaggaccagcaagccacgccaATGGCACCCCTGGCCTGCCACTATGGCTGCTGTCCAC
CGCTCTCCTCTCCCTGCTGGCTGGCAGCTCGGCCTTCTCTCCCATCCCCGCCT
GAAGGGACGCTTCCAGAGGGACCGCAGGAACATCCGGCCCAACATCATCTTGGT
GCTTACGGATGACCAGGATGTGGAGCTGGGCTCCATGCAAGTGATGAACAAGACA
AGGCGTATCATGGAGCAGGGCGGGGCGCACTTCATCAATGCCTTCGTGACTACAC
CAATGTGCTGTCCGTCTCGCTCCTCCATTCTCACCGGCAAGTACGTCCACAACCA
CAACACCTACACCAACAATGAGAATTGTTCTCGCCCTCCTGGCAGGCCCCAGCAC
GAGAGCCGCACCTTCGCCGTGTATCTCAACAGCACAGGCTACCGGACAGCTTTCT
TCGGAAAATACCTCAATGAGTACAACGGCTCATACGTGCCGCCCGGCTGGAAGGA
GTGGGTGCGCCTACTTAAGAACTCCCGCTTTTATAACTACACACTCTGCCGGAATG
GGGTGAAGGAGAAACATGGCTCAGACTACTCCACGGATTACCTCACGGATCTCAT
CACCAATGACAGTGTGAGCTTCTTCCGAACATCCAAGAAGATGTACCCACACAGG
CCCGTGCTCATGGTCATCAGCCACGCGGCTCCCCACGGCCCCGAGGACTCGGC
ACCGCAGTACTCACGGCTCTTCCCCAATGCGTCCCAGCACATCACACCGAGTTAC
AACTATGCACCCAACCCAGACAAGCATTGGATCATGCGCTACACGGGACCCATGA
AGCCCATTCACATGGAATTCACCAACATGCTACAACGCAAACGCCTACAGACCCTC
ATGTCTGTGGATGACTCCATGGAGACGATCTATGACATGCTGGTGGAGACGGGGG
AGCTGGACAACACGTACATCCTGTACACCGCCGACCACGGCTACCACATTGGCCA
GTTTGGGCTGGTGAAGGGCAAGTCTATGCCGTATGAATTCGACATCAGAGTCCCG
TTCTACGTGAGGGGGCCCCAACGTGGAAGCTGGCTCTCTGAACCCCCACATTGTC
CTCAACATTGACCTGGCCCCCACCATACTGGATATCGCTGGACTGGACATCCCTG
CAGACATGGACGGGAAGTCTATTCTCAAACCTACTGGACTCAGAGCGGCCAGTGAA
CCGGTTCCACTTGAAAAAGAAGCTGAGGGTCTGGCGAGACTCCTTCTGTTGGA
GAGAGGCAAACTGCTCCACAAGAGGGAGGGTGACAAAGTGAATGCCCAGGAGGA
GAACTTCCTGCCCAAGTACCAGCGCGTGAAGGACCTGTGTGAGGAGCTGAGTA
CCAGACAGCATGCGAACAGCTGGGGCAGAAGTGGCAGTGTGTGAGGAGGACGCTT
CTGGGACGCTGAAGCTGCACAAATGTAAAGGCCCATGCGGTTTGGTGGCGCG
GTGGCAGCAGAGCCCTCTCCAACCTGGTGCCCAAGTATGACGGCCAGAGCAGCG
AGGCCTGCAGCTGTGACAGTGGCGGTGGAGGGGACTACAAACTGGGCCTGGCT
GGACGCCGTAAAGCTCTTTAAGAAAAAGTATAAGACCAGCTATGCCCGGAACCGCT
CCATCCGTTCCGTGGCCATCGAGGTGGACGGTGAGATATACCACGTAGGCTTGG
TACTGTGCCTCAGCCCCGCAACCTTAGCAAGCCGCACCTGGCCAGGGGGCCCTGA
AGACCAAGATGACAAGGATGGTGGCAGTTTCAGTGGTACTGGTGGCCTTCCAGAT
TATTCTGCCCCCAATCCCATCAAAGTGACCCATCGGTGCTACATCCTTGAGAATGA
CACAGTCCAGTGCGACTTGGACCTGTACAAGTCCCTGCAGGCTTGGAAGACCA
CAAGCTGCACATCGACCATGAGATCGAAACCCTGCAGAACAAATTAAGAACCCTC
GAGAAGTCAGGGGTACCTGAAGAAGAAGCGACCGGAAGAATGTGACTGCCATA
AAATCAGTTACCACAGCCAACACAAAGGCCGTCTCAAGCACAAAGGCTCCAGCCT
GCACCCTTTCAGGAAGGGTCTGCAGGAGAAGGACAAGGTGTGGCTGCTGCGGG
AGCAGAAACGCAAGAAGAACTGCGCAAGCTGCTCAAACGGCTGCAGAACAACG
ATACGTGCAGCATGCCCGGCCTCACGTGCTTTACCCACGACAACCACTGGCA
GACGGCGCCACTCTGGACGCTGGGGCCGTTCTGCGCCTGCACCAGCGCCAACA
ACAACACGTACTGGTGCTTGAGGACCATAAATGAGACCCACAACCTTCTCTG
GAATTTGCAACCGGCTTCATAGAATACTTTGACCTCAGTACAGACCCCTACCAGCT
GATGAACGCGGTGAACACACTGGACAGGGACGTCCTTAACCAACTGCACGTGCA
GCTCATGGAGCTAAGGAGCTGTAAAGGCTACAAGCAGTGCAACCCCCGACCCG
CAACATGGACCTGGGGCTTAGAGACGGAGGAAGCTATGAACAATACAGGCAGTTT
CAGCGTCGAAAATGGCCAGAAATGAAGAGACCTTCTTCCAAATCACTGGGACAGC
TATGGGAAGGTTGGGAAGGCTAAgcgccatagagagaggaacctccaaaaccagggcctcgtgtg

FIG. 4A i

1002596 . 12. 10.1

gctgcccaggccatgcaaaaaacacccgattcccagaagatgaatgttggaactgggagacctgacagaaggcagg
gctgctcttgggacaggaaatcctggaggacagcgctggactttccgatgctcagtttcttgccttgctctggatca
aacctcactggctgctctgggatgctgctcacacctggagtctctgctcaccttccagaggctcacaagacaaagga
actaattccatggacacttctccagagatggaaattgctgggattcgccactcctccctgcacccctccccagtc
ctaggggaagcaagctgttttaaccttcttactcttggagaaagcacggacatcccagggtgctgtcaacctcacagtctga
caaagtctatagcacaaaacagtaccattcaccagggtggttgacctggctggctcagaagctgccttcaccacatacat
gaccgctcacacgtaaccaacacagggaattgtagggggaatctcactaatatgaaatcccgctttcaagagtcgcggtg
tcaataaacgctgtggctaggatcaaggataatcccttgagctttcagacattatcctgcccgggattcggtccttgtatcc
atcccagaactgatgttttctaaggtaccgaaacccaagtgtatgtgtcctgtgttttaatgacattgtattgtaaagttt
gtagtataagtaccatcttacagtggtcctgccccagccaatgtctagctattggtatgaaaaaaaaaattcttgaattttg
taaaaaaaaaaaaaa

FIG. 4A ii

FOR PUBLICATION

>mouse SULF2 amino acid sequence--translation of ORF
MAPPGPLWLLSTALLSLLAGSSAFLSHPRKGRFQRDRRNIRPNILVLTDQDVELGSM
QVMNKTRRIMEQGGAHFINAFVTTMPCCPSRSSILTGKYVHNHNTYTNNENCSSPSWQ
AQHESRTFAVYLNSTGYRTAFFGKYLNEYNGSYVPPGWKEWVGLLKNSRFYNYTLCRN
GVKEKHGSDYSTDYLTDLITNDSVSFFRTSKKMYPHRPVLMVISHAAPHGPEDSAPQYS
RLFPNASQHITPSYNYAPNPDKHWIMRYTGPMKPIHMEFTNMLQRKRLQTLMSVDDSM
ETIYDMLVETGELDNTYILYTADHGYHIGQFGLVKGKSMPIYEFDIRVPFYVRGPNVEAGSL
NPHIVLNIDLAPTILDIAGLDIPADMDGKSILKLLDSERPVNRFHLKKKLRVWRDSFLVERG
KLLHKREGDKVNAQEENFLPKYQRVKDLCQRAEYQTACEQLGQKWQCVEDASGTLKL
HKCKGPMRFGGGGGSRALSNLVPKYDGQSSEACSCDSGGGGDYKLGLAGRRKLFKKK
YKTSYARNRSIRSVAIEVDGEIYHVGLDTPVQPRNLSKPHWPGAPEDQDDKDGGSFSGT
GGLPDYSAPNPIKVTHRCYILENDTVQCDLDLYKSLQAWKDHKLHIDHEIETLQNKIKNLR
EVRGHLKKKRPEECDCHKISYHSQHKGRCLKHKGSSLHPFRKGLQEKDKVWLLREQKRK
KKLRKLLKRLQNNDTCSMPGLTCFTHDNHHWQTAPLWTLGPFCACTSANNNTYWCLRT
INETHNFLFCEFATGFIEYFDLSTDPYQLMNAVNTLDRDVLNQLHVQLMELRSCKGYKQC
NPRTRNMDLGLRDGGSYEQYRQFQRRKWPEMKRPSSKSLGQLWEGWEG-

FIG. 4B

FIG. 4B

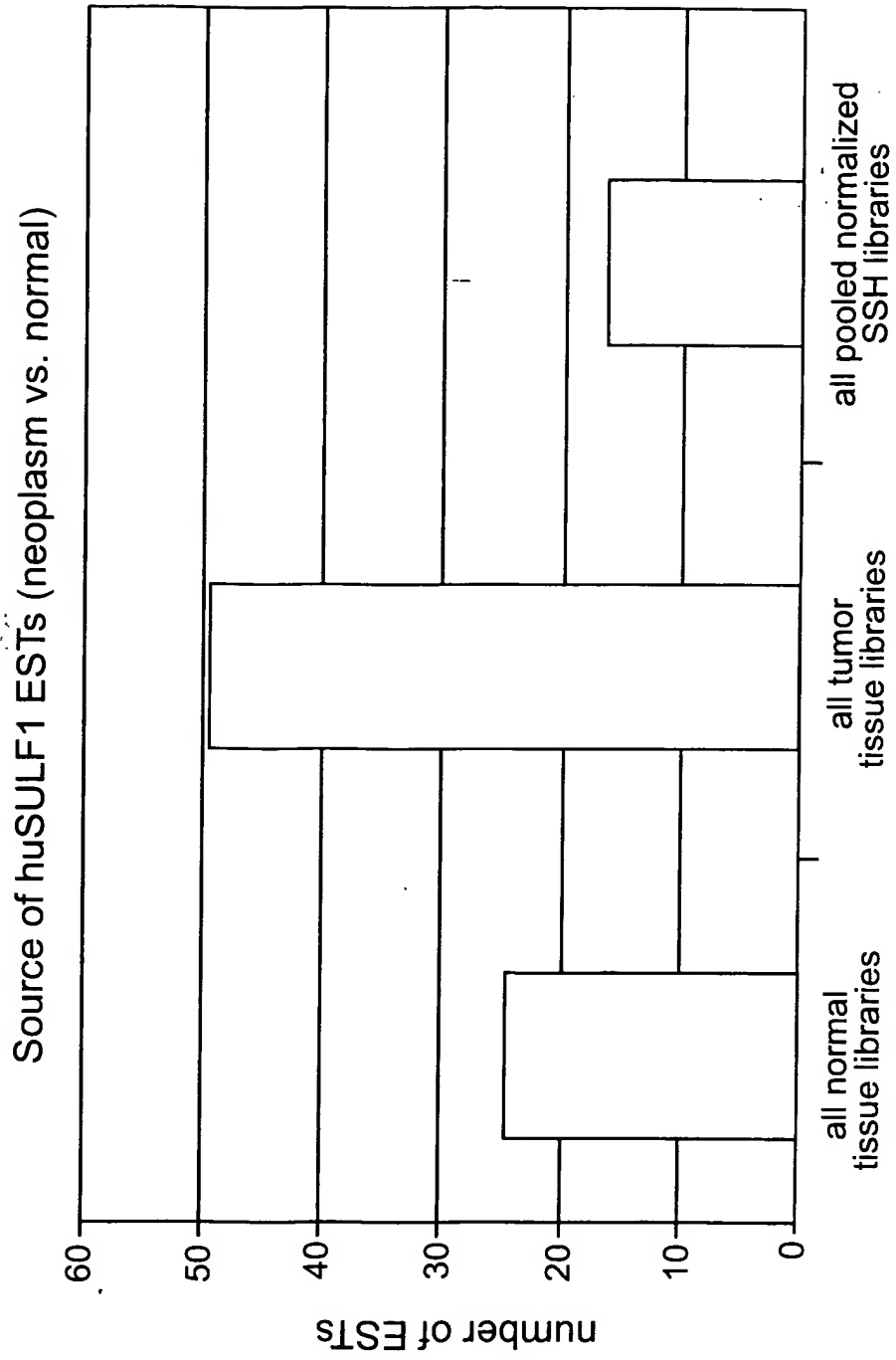


FIG. 5

Source of huSULF1 ESTs (detailed)

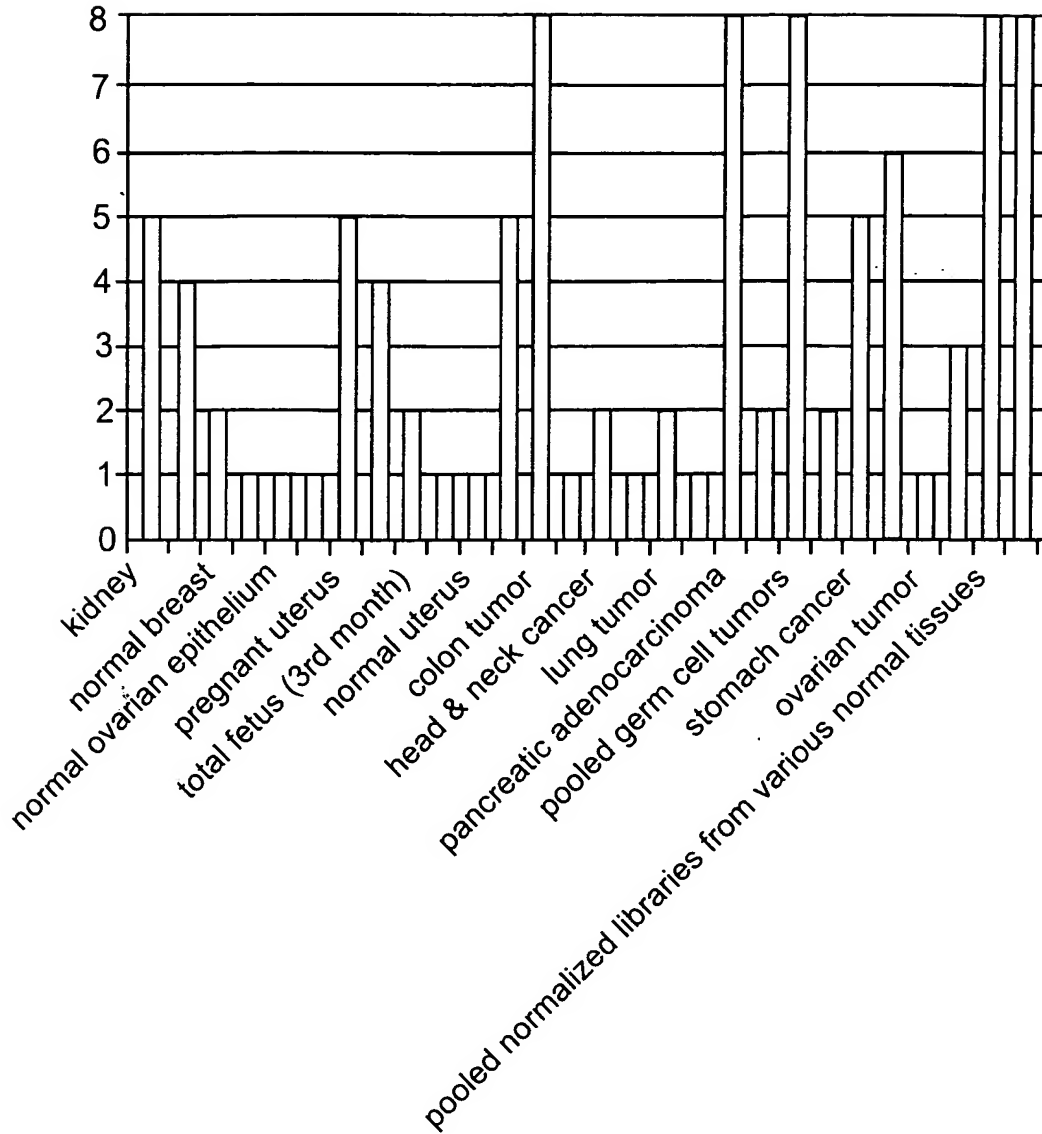


FIG. 6

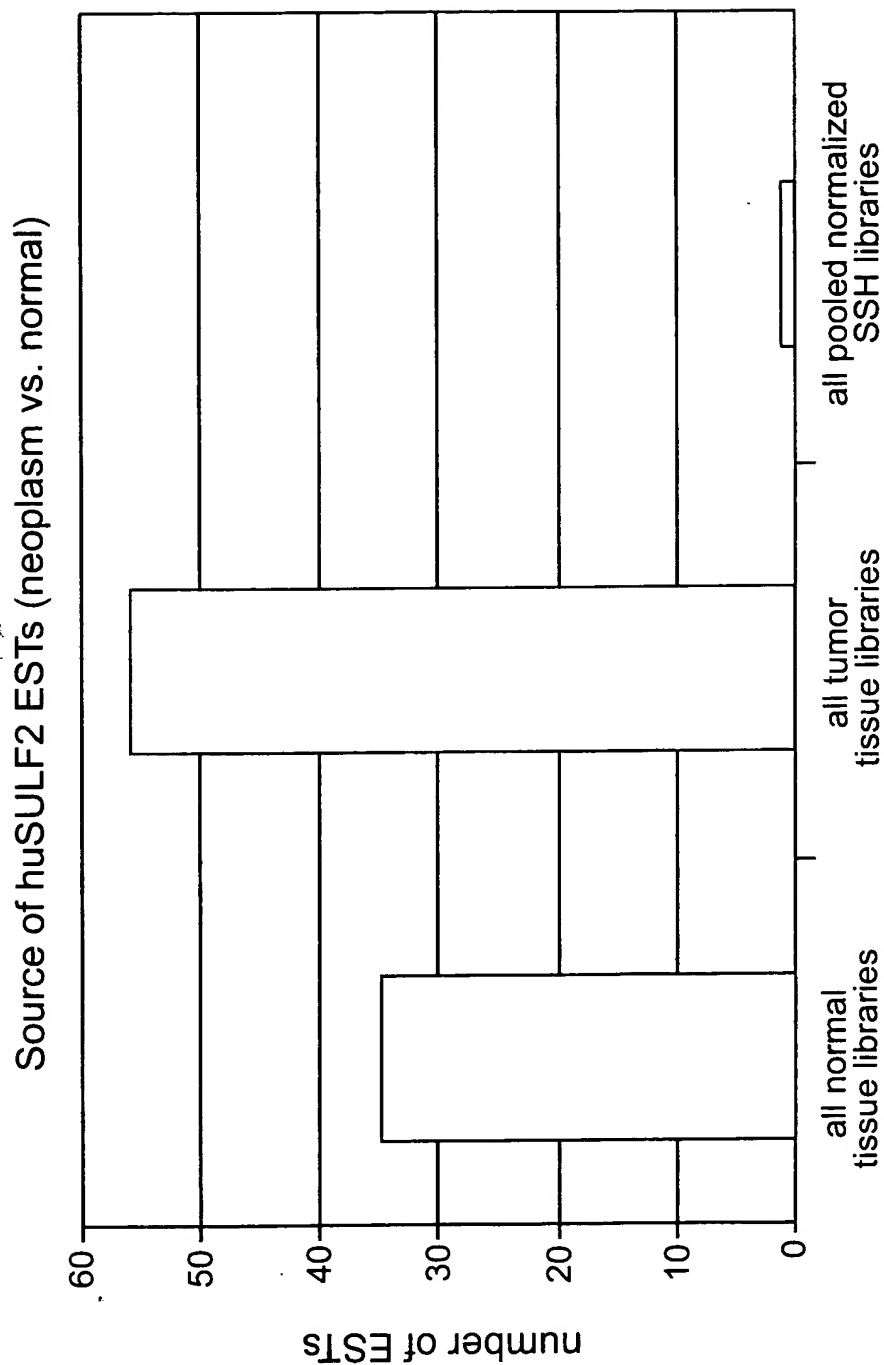


FIG. 7

FIG. 7

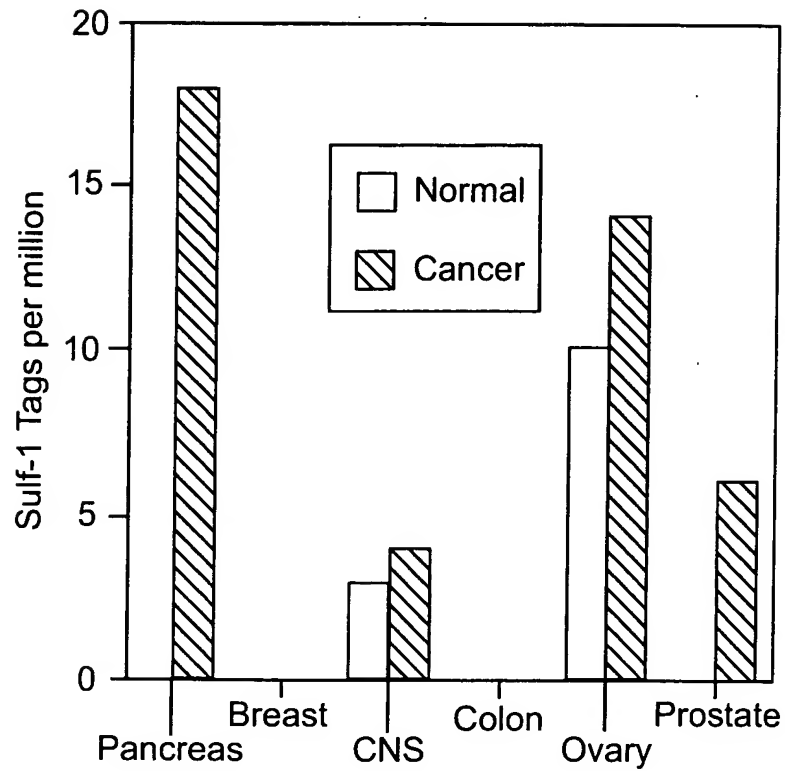


FIG. 8

FIG. 8

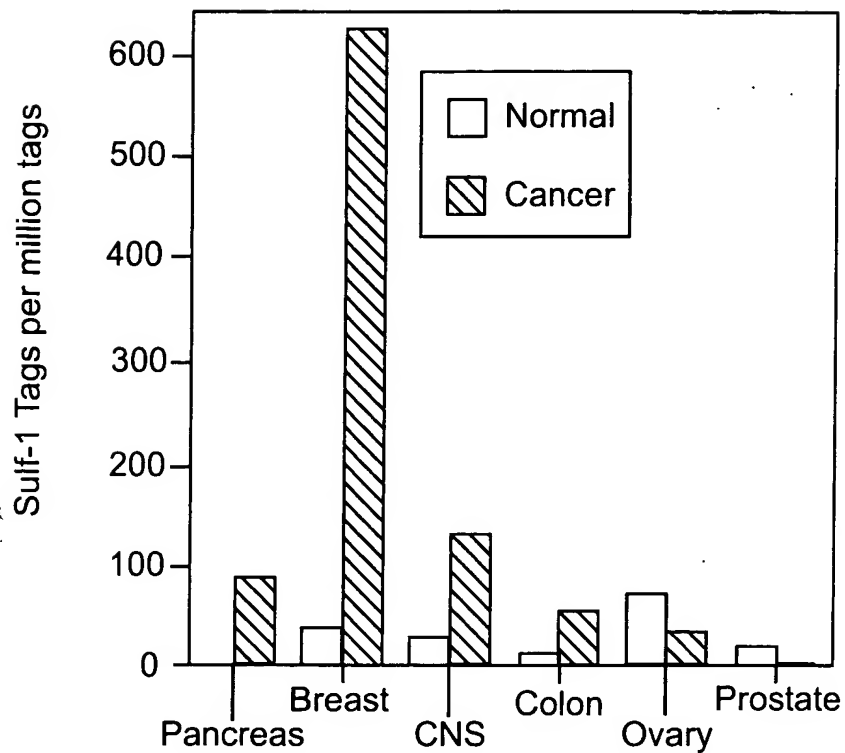


FIG. 9

> human SULF2 full length cDNA (ORF is highlighted in capitals and a 5' inframe stopcodon is underscored)

ggcacgagggccatttctggacaacagctgctattttcacttgagcccaagttaatttctcggggagttctcgggcgcgacaca
ggcagctcgggttgccttgcgattgagctgcgggtcgcgccggcgccgctctccaatggcaaagtgtgtgtggctggag
gcgagcgcgaggcttctcgcaaaaggcagtcgagtggttcagaccggggcgagtcctgtgaaagcagataaaagaaaa
cattattaacgtgtcattacgaggggagcgcccgccggggctgtgcactccccgcggaacatttggctccctccagctc
ctagagaggagaagaagaagcggaaaagaggcagattcacgtcgttccagccaagtggacctgatcgatggccctc
ctgaatttatcacgatatttgattattagcgatgccccctggttgtgtgttacgcacacacacgtgcacacaaggctctggctc
gcttccctccctcggttccagctcctgggcaatcccacatctgttcaactctccgccgagggcgagcaggagcgagagtg
gtcgaatctgcgagtgaaagagggacgagggaaaagaacaaagccacagacgcaacttgagactcccgcatcccaa
aagaagcaccgatcagcaaaaaagaagATGGGCCCCCGAGCCTCGTGCTGTGCTTGCTG
TCCGCAACTGTGTTCTCCCTGCTGGGTGGAAGCTCGGCCTTCCTGTCGCACCACC
GCCTGAAAGGCAGGTTTCAGAGGGACCGCAGGAACATCCGCCCAACATCATCCTG
GTGCTGACGGACGACCAGGATGTGGAGCTGGGTTCATGCAGGTGATGAACAAGA
CCCGGCGCATCATGGAGCAGGGCGGGGCGCACTTCATCAACGCCTTCGTGACCAC
ACCCATGTGCTGCCCCCTCACGCTCCTCCATCCTCACCGGCAAGTACGTCCACAACC
ACAACACCTACACCAACAATGAGAACTGCTCCTCGCCCTCCTGGCAGGCACAGCAC
GAGAGCCGCACCTTTGCCGTGTACCTCAATAGCACTGGCTACCGGACAGCTTTCTT
CGGGAAGTATCTTAATGAATACAACGGCTCCTACGTGCCACCCGGCTGGAAGGAGT
GGGTGCGACTCCTTAAAACTCCCGCTTTTATAACTACACGCTGTGTGCGAACGGGG
TGAAAGAGAAGCACGGCTCCGACTACTCCAAGGATTACCTCACAGACCTCATCACC
AATGACAGCGTGAGCTTCTTCCGCACGTCCAAGAAGATGTACCCGCACAGGCCAGT
CCTCATGGTCATCAGCCATGCAGCCCCCACGGCCCTGAGGATTACGCCCCACAAT
ATTCACGCCTCTTCCCAAACGCATCTCAGCACATCACGCCGAGCTACAACCTACGCGC
CCAACCCGGACAAACACTGGATCATGCGCTACACGGGGCCCATGAAGCCCATCCAC
ATGGAATTCACCAACATGCTCCAGCGGAAGCGCTTGAGACCCCTCATGTGCGGTGGA
CGACTCCATGGAGACGATTTACAACATGCTGGTTGAGACGGGCGAGCTGGACAACA
CGTACATCGTATACACCGCCGACCACGGTTACCACATCGGCCAGTTTGGCCTGGTG
AAAGGGAAATCCATGCCATATGAGTTTGACATCAGGGTCCCGTTCTACGTGAGGGGG
CCCAACGTGGAAGCCGGCTGTCTGAATCCCCACATCGTCCTCAACATTGACCTGGC
CCCCACCATCCTGGACATTGCAGGCCTGGACATACCTGCGGATATGGACGGGAAAT
CCATCCTCAAGCTGCTGGACACGGAGCGGCCGTGAATCGGTTTCACTTGAAAAAG
AAGATGAGGGTCTGGCGGGACTCCTTCTTGGTGGAGAGAGGCAAGCTGCTACACA
AGAGAGACAATGACAAGGTGGACGCCCAGGAGGAGAACTTTCTGCCCAAGTACCA
GCGTGTGAAGGACCTGTGTGAGCGTGCTGAGTACCAGACGGCGTGTGAGCAGCTG
GGACAGAAGTGGCAGTGTGTGGAGGACGCCACGGGGAAGCTGAAGCTGCATAAGT
GCAAGGGCCCCATGCGGCTGGGCGGCAGCAGAGCCCTCTCCAACCTCGTGCCCA
AGTACTACGGGCAGGGCAGCGAGGCCTGCACCTGTGACAGCGGGGACTACAAGCT
CAGCCTGGCCGGACGCCGGAaaaaaactcttcaagaagaagtacaaggccagctatg
TCCGCAGTCGCTCCATCCGCTCAGTGGCCATCGAGGTGGACGGCAGGGTGTACCA
CGTAGGCCTGGGTGATGCCGCCCAGCCCCGAAACCTCACCAAGCGGCACTGGCCA
GGGGCCCCCTGAGGACCAAGATGACAAGGATGGTGGGGACTTCAGTGGCACTGGAG
GCCTTCCCGACTACTCAGCCGCCAACCCCATTAAGTGACACATCGGTGCTACATCC
TAGAGAACGACACAGTCCAGTGTGACCTGGACCTGTACAAGTCCCTGCAGGCCTGG
AAAGACCACAAGCTGCACATCGACCACGAGATTGAAACCCTGCAGAACAAAATTAAG
AACCTGAGGGAAGTCCGAGGTACCTGAAGAAAAAGCGGCCAGAGAAGATGTGACT
GTCACAAAATCAGCTACCACACCCAGCACAAAGGCCGCTCAAGCACAGAGGCTCC
AGTCTGCATCCTTTCAGGAAGGGCCTGCAAGAGAAGGACAAGGTGTGGCTGTTGC
GGGAGCAGAAGCGCAAGAAGAACTCCGCAAGCTGCTCAAGCGCCTGCAGAACAA

FIG. 10A i

10025966-123101

CGACACGTGCAGCATGCCAGGCCTCACGTGCTTCACCCACGACAACCAGCACTGG
CAGACGGCGCCTTTCTGGACACTGGGGCCTTTCTGTGCCTGCACCAGCGCCAACA
ATAACACGTACTGGTGCATGAGGACCATCAATGAGACTCACAATTTCTTCTGTG
AATTTGCAACTGGCTTCCTAGAGTACTTTGATCTCAACACAGACCCCTACCAGCTGA
TGAATGCAGTGAACACACTGGACAGGGATGTCCTCAACCAGCTACACGTACAGCTC
ATGGAGCTGAGGAGCTGCAAGGGTTACAAGCAGTGTAACCCCCGGACTCGAAACA
TGGACCTGGGACTTAAAGATGGAGGAAGCTATGAGCAATACAGGCAGTTTCAGCGT
CGAAAGTGGCCAGAAATGAAGAGACCTTCTTCCAAATCACTGGGACAACCTGTGGG
AAGGCTGGGAAGGTTAAgaaacaacagaggtggacctccaaaaacatagaggcatcacctgactgcacag
gcaatgaaaaacatgtgggtgattccagcagacctgtgctattggccaggaggcctgagaaagcaagcacgactct
cagtcaacatgacagattctggaggataaccagcaggagcagagataacttcaggaagtcattttgcccctgctttgct
ttggattatacctcaccagctgcacaaaatgcatttttcgtatcaaaaagtcaccactaacctccccagaagctcaca
aggaaaacggagagagcgcagcgcagagagatttccttgaaattctcccaaggcgaaagtcattggaattttaaatca
taggggaaaagcagtcctgttctaatacctcttattctttggttgcacaaagaaggaaactaagaagcaggacagaggc
aacgtggagaggctgaaaacagtcagagacgtttgacaatgagtcagtagcacaaaagagatgacatttacctagca
tataaacctggttgctctgaagaaactgccttcattgtatatagtgactatttacatgtaatcaacatgggaacttttagggg
aacctaataagaaatcccaatttcaggagtggtggtgtcaataaacgctctgtggccagtgtaaaagaaaaaaaaaaa
aaattgtggacatttctgttctgtccagataccatttctcctagttatttctgtatgtccagaactgatgttttttaagggtact
gaaaagaaatgaagttgatgtatgtcccaagtttgatgaaactgtattgtaaaaaaattttgtagtttaagtattgtcataca
gtgttcaaaacccagccaatgaccagcagttggtatgaagaacctttgacattttgtaaaaggccatttctggggaaaaa
aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa

FIG. 10A ii

10025966-121101

>human SULF2 protein (translation of ORF)

MGPPSLVLCLLSATVFSLLGGSSAFLSHHRLKGRFQRDRRNIRPNIILVLTDDQDVELGS
MQVMNKTRRIMEQGGAHFINAFVTTPMCCPSRSSILTGKYVHNHNTYTNNENCSSPS
WQAQHESTRFAVYLNSTGYRTAFFGKYLNEYNGSYVPPGWKEWVGLLKNSRFYNYTL
CRNGVKEKHGSDYSKDYLTDLITNDSVSFFRTSKKMYPHRPVLMVISHAAPHGPEDSA
PQYSRLFPNASQHITPSYNYAPNPDKHWIMRYTGPMKPIHMEFTNMLQRKRLQTLMSV
DDSMETIYNMLVETGELDNTYIVYTADHGYHIGQFGLVKGKSMPYEFDIRVPFYVRGPN
VEAGCLNPHIVLNIDLAPTILDIAGLDIPADMMDGKSILKLLDTERPVNRFHLKKKMRVWRD
SFLVERGKLLHKRDNDKVDAQEENFLPKYQRVKDLCQRAEYQTACEQLGQKWQCVED
ATGKLLHKCKGPMRLGGSRALSNLVPKYYGQGSEACTCDSGDYKLSLAGRRKKLFFK
KYKASYVRSRSIRSVAIEVDGRVYHVGLGDAAQPRNLTKRHWPGAPEDQDDKDGDF
SGTGGLPDYSAANPIKVTHRCYILENDTVQCDLDLYKSLQAWKDHKLHIDHEIETLQNKI
KNLREVRGHLKKKRPEECDCHKISYHTQHKGRLKHRGSSLHPFRKGLQEKDQKWWLLR
EQKRKKKLRKLLKRLQNNDTCSMPGLTCFTHDNQHWQTAPFWTLGPFCACTSANNNT
YWCMRTINETHNFLFCEFATGFLEYFDLNTDPYQLMNAVNTLDRDVLNQLHVQLMELR
SCKGYKQCNPRTNRNMDLGLKDGGSYEQYRQFQRRKWPEMKRPSSKSLGQLWEGWE
G

FIG. 10B

FIG. 10B

>mouse SULF2 full length cDNA (ORF highlighted in capitals)
ggcgccgagatcctgaggaagaggggaaggaatcccatcctcacgacaccacctcggcctctgcatccaggaagaa
gcaaaggaccagcaagccacgccaATGGCACCCCTGGCCTGCCACTATGGCTGCTGTCCAC
CGCTCTCCTCTCCCTGCTGGCTGGCAGCTCGGCCTTCTCTCCCATCCCCGCCTGA
AGGGACGCTTCCAGAGGGACCGCAGGAACATCCGGCCCAACATCATCTTGGTGCTT
ACGGATGACCAGGATGTGGAGCTGGGCTCCATGCAAGTGATGAACAAGACAAGGCG
TATCATGGAGCAGGGCGGGGCGCACTTCATCAATGCCTTCGTGACTACACCAATGTG
CTGTCCGTCTCGCTCCTCCATTCTCACCGGCAAGTACGTCCACAACCACAACACCTA
CACCAACAATGAGAATTGTTCTCGCCCTCCTGGCAGGCCCAGCACGAGAGCCGCA
CCTTCGCCGTGTATCTCAACAGCACAGGCTACCGGACAGCTTTCTTCGGAAAATACCT
CAATGAGTACAACGGCTCATACTGCGCCCGGCTGGAAGGAGTGGGTGCGCCTAC
TTAAGAACTCCCGCTTTTATAACTACACACTCTGCCGGAATGGGGTGAAGGAGAAACA
TGGCTCGGACTACTCCACGGATTACCTCACGGATCTCATGACCAATGACAGTGTGAG
CTTCTTCCGAACATCCAAGAAGATGTACCCACACAGGCCCGTGCTCATGGTCATCAG
CCACGCGGCTCCCCATGGCCCCGAGGACTCAGCACCCAGTACTCACGGCTCTTCC
CCAATGCGTCCCAGCACATCACACCGAGTTACAATATGCACCCAACCCAGACAAGC
ATTGGATCATGCGCTACACGGGACCCATGAAGCCCATTCACATGGAATTCACCAACAT
GCTACAACGAAAACGCCTACAGACCCTCATGTCTGTGGATGACTCCATGGAGACGAT
CTATGACATGCTGGTGGAGACGGGGGAGCTGGACAACACGTACATCCTGTACACCGC
CGACCACGGCTACCACATTGGCCAGTTTGGGCTGGTGAAGGGCAAGTCTATGCCGTA
TGAATTCGACATCAGAGTCCCGTTCTACGTGAGGGGGCCCCAACGTGGAAGCTGGCT
CTCTGAACCCCCACATTGTCTCAACATTGACCTGGCCCCCACCATACTGGATATCGC
TGGACTGGACATCCCTGCAGACATGGACGGGAAGTCTATTCTCAAATACTGGACTC
AGAGCGGCCAGTGAACCGGTTCCACTTGAAAAAGAAGCTGAGGGTCTGGCGAGACT
CCTTCTGGTGGAGAGAGGCAAATGCTCCACAAGAGGGGAGGGTGACAAAGTGAAT
GCCCAGGAGGAGAACTTCTGCCCAAGTACCAGCGCGTGAAGGACCTGTGTACAGC
AGCTGAGTACCAGACAGCATGCGAACAGCTGGGGCAGAAGTGGCAGTGTGTGGAGG
ACGCTTCTGGGACGCTGAAGCTGCACAAATGTAAAGGCCCCCATGCGGTTTGGTGGC
GGCGGTGGCAGCAGAGCCCTCTCCAACCTGGTGCCCAAGTATGACGGCCAGAGCA
GCGAGGCCTGCAGCTGTGACAGTGGCGGTGGAGGGGACTACAACTGGGCCTGGC
TGGACGCCGTAAGCTCTTTAAGAAAAAGTATAAGACCAGCTATGCCCGGAACCGCTC
CATCCGTTCCGTGGCCATCGAGGTGGACGGTGAGATATACCACGTAGGCTTGGATAC
TGACCTCAGCCCCGCAACCTTAGCAAGCCGCACTGGCCAGGGGGCCCTGAAGACC
AAGATGACAAGGATGGTGGCAGTTTCAGTGGTACTGGTGGCCTTCCAGATTATTCTGC
CCCCAATCCCATCAAAGTGACCCATCGGTGCTACATCCTTGAGAATGACACAGTCCAG
TGCGACTTGGACCTGTACAAGTCCCTGCAGGCTTGGAAGACCACAAGCTGCACATC
GACCATGAGATCGAAACCCTGCAGAACAAAATTAAGAACCTTCGAGAAGTCAGGGGT
CACCTGAAGAAGAAGCGACCGGAAGAATGTGACTGCCATAAATCAGTTACCACAGC
CAACACAAAGGCCGTCTCAAGCACAAAGGCTCCAGCCTGCACCCTTTCAGGAAGGG
TCTGCAGGAGAAGGACAAGGTGTGGCTGCTGCGGGAGCAGAAACGCAAGAAGAAA
CTGCGCAAGCTGCTCAAACGGCTGCAGAACAAACGATACGTGCAGCATGCCCGGCCT
CACGTGCTTTACCCACGACAACCACCACTGGCAGACGGCGCCACTCTGGACGCTGG
GGCCGTTCTGCGCCTGCACCAGCGCCAACAACAACACGTAAGTGGTGGTGGAGGACC
ATAAATGAGACCCACAACCTTCTCTTCTGCGAATTTGCAACCGGCTTCATAGAATACTT
TGACCTCAGTACAGACCCCTACCAGCTGATGAACGCGGTGAACACACTGGACAGGG
ACGTCCTTAACCAACTGCACGTGCAGCTCATGGAGCTAAGGAGCTGTAAAGGCTACA
AGCAGTGCAACCCCCGGACCCGCAACATGGACCTGGGGCTTAGAGACGGAGGAAG
CTATGAACAATACAGGCAGTTTCAGCGTCGAAAATGGCCAGAAATGAAGAGACCTTCT
TCCAAATCACTGGGACAGCTATGGGAAGGTTGGGAAGGCTAAGcgccatagagagaggaac

FIG. 11Ai

ctccaaaaccaggggacctgctggtgcccaggccatgcaaaaaacacccgattcccagaagatgaatgttgaact
gggagacctgacagaaggcagggcctgctcttgggacaggaaatcctggaggacagcgctggactttccgatgtca
gtttcttggccctgcttggatcaaacctcactggctgctctgggatgctgctcacacctggagtctctgctcaccttct
agaggctcacaagacaaaggaactaatttccatggacacttctccagagatggaaattgctgggattcgcccactcct
ccctgcacccctccccagtcactaggggaagcaagctgttttaaccttcttactcttggagaaagcacggacatcca
ggtgctgtcaacctcacagtctgacaaagtctatagcacaaaacagtaccattcaccaggctggtgacctggctggctc
agaagctgccttcaccacatacatgaccgctcacacgtaaccaacacagggaattgtagggaatctactaatatgaa
atcccgctttcaagagtcgcggtgtcaataaacgctgtggctaggatcaaggataatcccttgagcttccagacatttattcct
gcccgggattcggtccttgttatccatcccagaactgatgttttctaaggtagcgaaccccaagtgatgtgtgtcctgtgttt
aatgacattgtattgtaaagttttagtataagtagcatcttacagtgttctgccccagccaatgtctagctattggtatgaa
aaaaaaaaatcttgaattttgtaaaaaaaaaaaaaaaaa

FIG. 11A ii

FIG. 11A ii

>mouse SULF2 protein (translation of ORF)
MAPPGPLPLWLLSTALLSLLAGSSAFLSHPRLKGRFQRDRRNIRPNILVLTDDQDVELG
SMQVMNKTRRIMEQGGGAHFVTTMCCPSRSSILTGKYVHNHNTYTNNENCSS
PSWQAQHESTRFAVYLNSTGYRTAFFGKYLNEYNGSYVPPGWKEWVGLLKNSRFY
NYTLCRNGVKEKHGSDYSTDYLTDLITNDSVSFFRTSKKMYPHRPVLMVISHAAPHG
PEDSAPQYSRLFPNASQHITPSYNYAPNPDKHWIMRYTGPMKPIHMEFTNMLQRKR
LQTLMSVDDSMETIYDMLVETGELDNTYILYTADHGYPHIGQFGLVKGKSMPEYFDIRV
PFYVRGPNVEAGSLNPHIVLNIDLAPTILDIAGLDIPADMKGKLSILKLLDSERPVNRFHL
KKKLRVWRDSFLVERGKLLHKREGDKVNAQEENFLPKYQRVKDLCQRAEYQTACE
QLGQKWQCVEDASGTLKLHKCKGPMRFGGGGGSRALSNLVPKYDGQSSEACSCD
SGGGGDYKLGLAGRRKLFKKKYKTSYARNRSIRSVAIEVDGEIYHVGLDTPVQPRNL
SKPHWPGAPEDQDDKDGGSFSGTGGLPDYSAPNPIKVTHRCYILENDTVQCDLDLY
KSLQAWKDHKLHIDHEIETLQNKIKNLREVRGHLKKKRPEECDCHKISYHSQHKGRL
KHKGSSLHPFRKGLQEKDQVWLLREQKRKKLRKLLKRLQNNDTCMPGLTCFTHD
NHHWQTAPLWTLGPFCACTSANNNNTYWCLRTINETHNLFCEFATGFIEYFDLSTDP
YQLMNAVNTLDRDVLNQLHVQLMELRSCKGYKQCNPRTRNMDLGLRDGGSYEQYR
QFQRRKWPEMKRPSSKSLGQLWEGWEG

FIG. 11B

10025966-122101

FIG. 12

Genomic Organization of huSULF2 gene
numbers represent base pairs

Contig exon start end length gap

I 159532	1	66100	66668	568	
					28587
	2	95255	95529	274	
					20271
	3	115800	116039	239	
					34042
	4	150081	150232	151	

>13577

II 2152	5	1508	1677	169	
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>5146

III 17546	6	4672	4822	150	
					1266
	7	6088	6263	175	
					4190
	8	10453	10581	128	
					1543
	9	12124	12180	56	
					455
	10	12635	12764	129	
					4101
	11	16865	17060	195	

>4971

IV 87036	12	4486	4714	228	
					308
	13	5022	5118	96	
					564
	14	5682	5776	94	
					1010
	15	6786	6845	59	
					508
	16	7353	7522	169	
					241
	17	7763	7905	142	
					1225
	18	9130	9253	123	
					2043
	19	11296	11329	33	
					245
	20	11574	11627	53	
					1007
	21	12634	13620	986	

FIG. 12

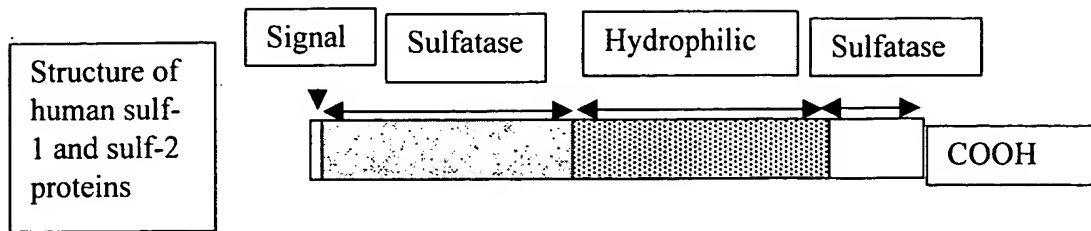


FIG. 13

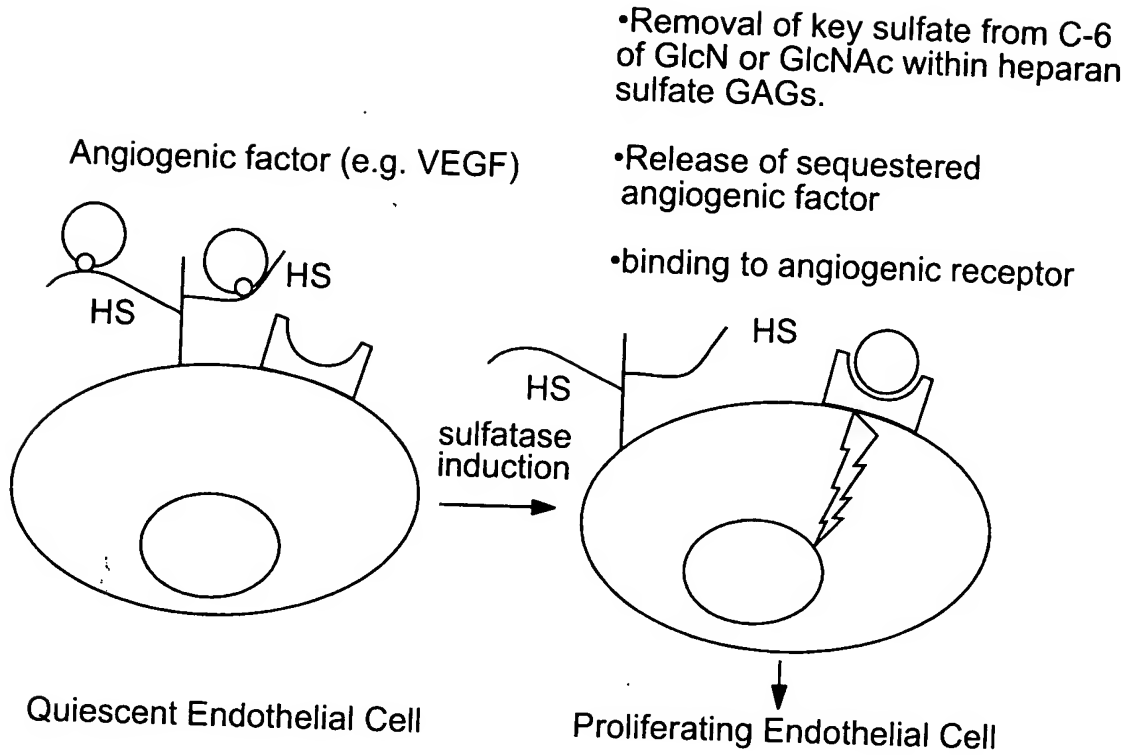


FIG. 14